

Appendix B: Ambient Noise Assessment



PRE-CONSTRUCTION AMBIENT NOISE ASSESSMENT

Bent Tree North Wind Project

Freeborn County, Minnesota

JULY 3, 2024

PREPARED FOR:

Wisconsin Power & Light
(Alliant Energy Corporation)

PREPARED BY:

Westwood

Westwood

Pre-Construction Ambient Noise Assessment

Bent Tree North Wind Project
Freeborn County, Minnesota

Prepared For:

Wisconsin Power & Light (Alliant Energy
Corporation)
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Project Number: R0035761.00
Date: July 3, 2024

Executive Summary

Westwood Professional Services, Inc. (Westwood) was contracted to conduct pre-construction ambient noise monitoring for the Bent Tree North Wind Project (Project) located in Freeborn County, Minnesota. This monitoring was conducted as required by Minnesota Commerce Department's *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota*. The measurement methodology was prepared in accordance with National Association of Regulatory Utility Commissioners (NARUC) guidance document prepared for the Minnesota Public Utilities Commission, *Assessing Sound Emissions from Proposed Wind Farms & Measuring the Performance of Completed Projects*.

Westwood collected measurements from April 2nd through April 15th at five (5) locations across the proposed Project area. Data was processed and filtered by precipitation and wind speeds, and overall daytime/nighttime averages were calculated.

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1.0 Site Description & Measurement Locations

The proposed Project is located in Freeborn County, Minnesota. Unattended long-term measurements were taken at five (5) monitoring points throughout the Project area. Locations were selected to represent the overall Project area. The primary land uses in the Project area are agricultural and rural residential. **Figure 1** shows an overview of the Project layout and measurement locations. Detailed measurement location figures can be found in **Appendix A**.

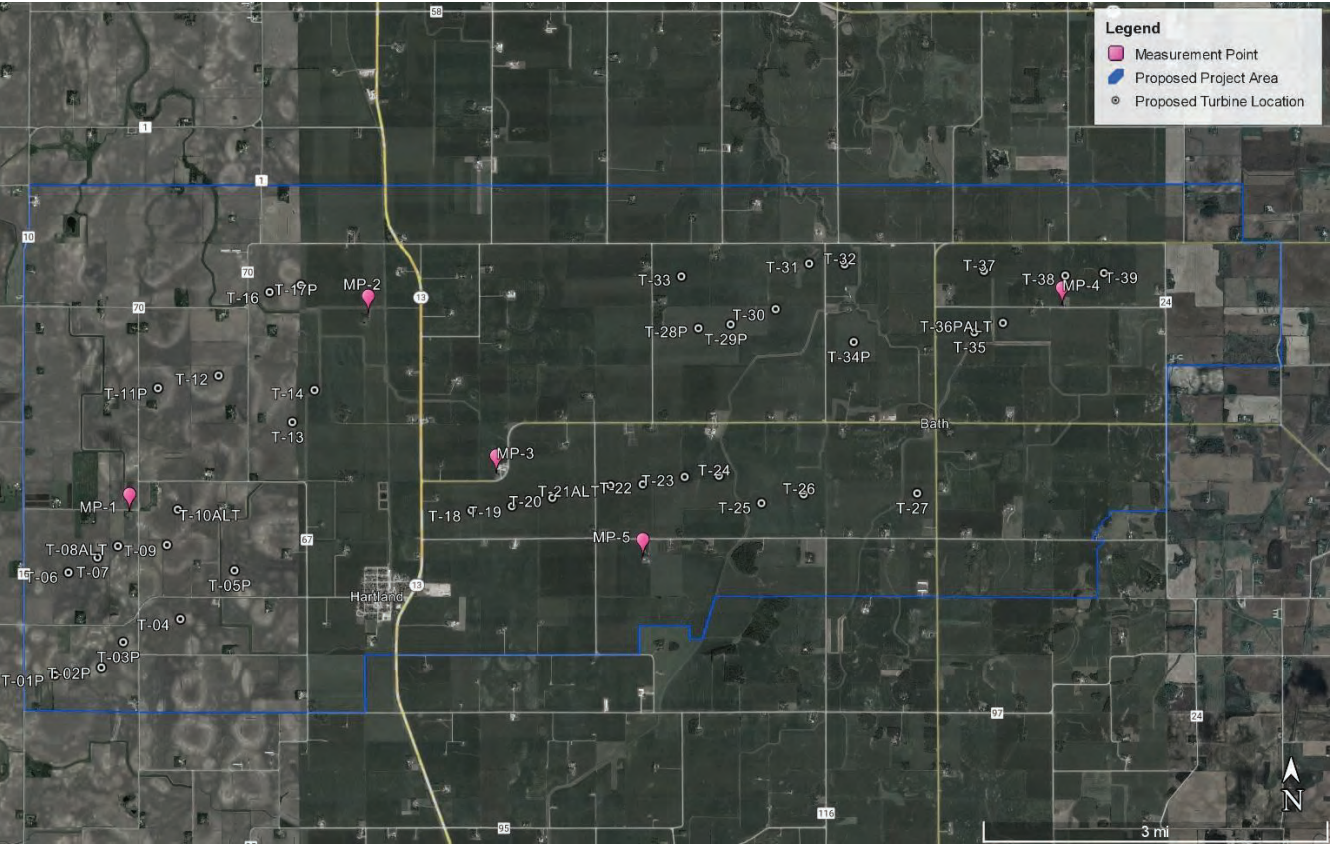


Figure 1: Project Overview & Measurement Locations

2.0 Regulatory Setting

The relevant regulations are set forth within the Minnesota Commerce Department's *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota*:

- 8.4.1. Provide existing ambient sound levels and projected post-project sound levels including total sound and turbine only noise. Provide the method or type of model used to determine noise levels.

The methodology herein was developed with reference to with the National Association of Regulatory Utility Commissioners (NARUC) guidance document prepared for the Minnesota Public Utilities Commission, *Assessing Sound Emissions from Proposed Wind Farms & Measuring the Performance of Completed Projects* as well as the Minnesota Commerce Department's *Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report*.

3.0 Measurement Methodology

Long-term unattended noise measurements were conducted over 14 days at 5 locations throughout the Project area. Monitoring was conducted during leaf off conditions, capturing a variety of wind speed conditions in order to provide wholly representative data. Field photos were taken at each measurement location, and a field sheet was completed for each measurement window. Weather readings were collected from the nearest meteorological station located within the proposed Project area. Field photos and field sheets can be found in **Appendix B** and **Appendix C** respectively.

Measurements were taken with NTI XL3 Class I Sound Level Meters, equipped with 7-inch windscreens. Each meter was within its annual lab calibration window. Additionally, each meter was field calibrated before and after the measurement period with a CAL 200 Class I calibrator. This instrumentation complies with ANSI S1.4 Class I and IEC 61672 Class I instrumentation requirements. Each meter was sited away from any acoustically reflective surfaces and set to record 1-second A-weighted broadband Leq values continuously for the duration of the measurement period. Leq is the time-averaged sound level and represents the total sound energy measured over a period of time. Meters were also set to record audio throughout the measurement period.

Long-term meters were deployed to collect data for two weeks. Measurements were recorded starting the afternoon of April 2nd and ending the afternoon of April 15th, 2024.

4.0 Monitoring Results

Measurement data was converted from measured LAeq-1 second to LAeq-1 hour averages. Noise levels varied over the course of the measurement period, primarily due to varied wind speeds and rural traffic. Measurement data was processed, filtered, and compared with the concurrently measured meteorological data. Data collected during periods of precipitation or when wind speeds exceeded 5.5 m/s (12 mph) was excluded from the analysis. The filtered data

was sorted into daytime and nighttime. Daytime and nighttime averages at each measurement location are shown in **Table 1** below.

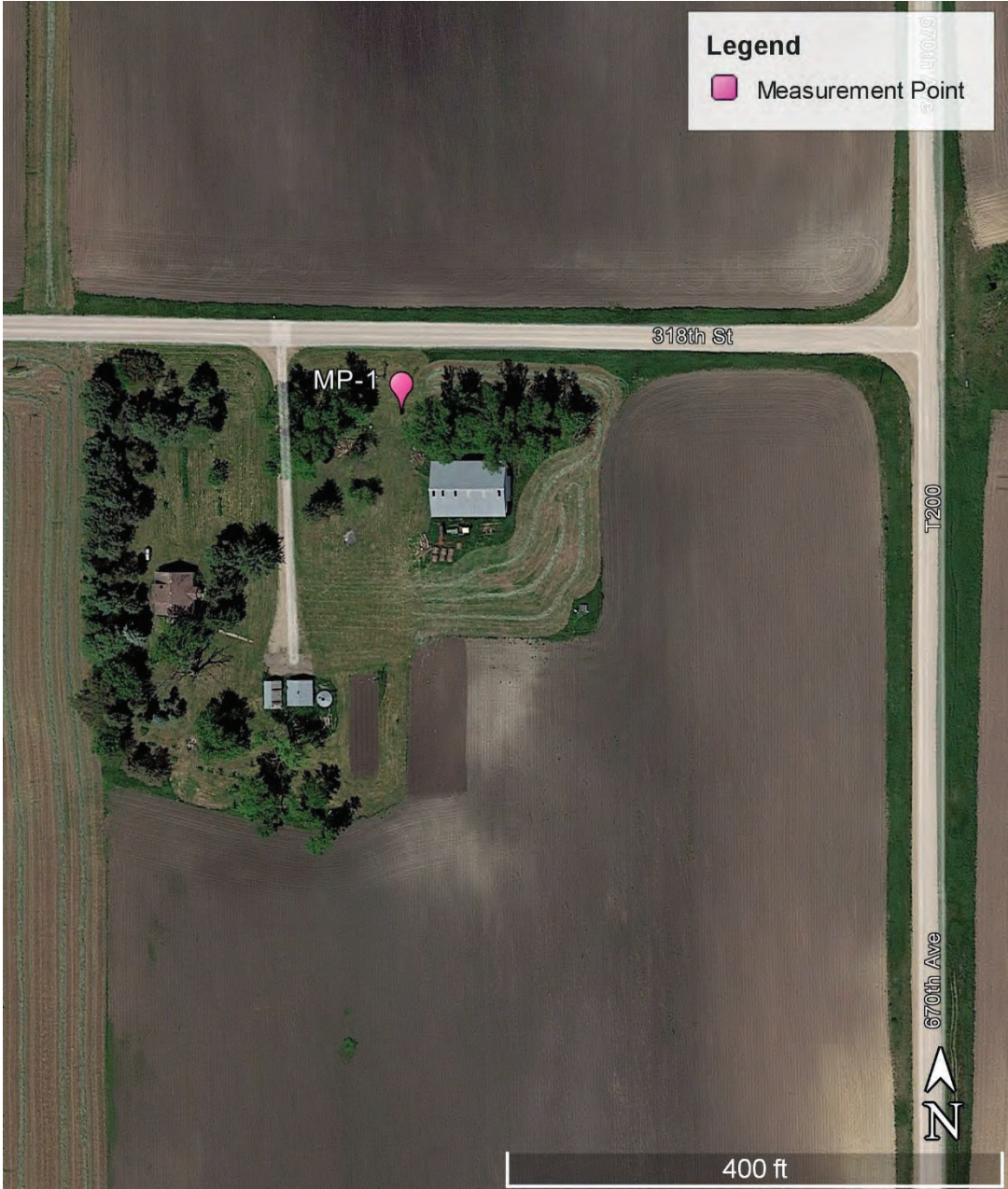
Measurement Location	Average Leq-1 hour (dBA)	
	Daytime (7 am – 10 pm)	Nighttime (10 pm – 7 am)
MP-1	54.8	54.7
MP-2	53.5	52.7
MP-3	53.8	49.6
MP-4	51.9	50.7
MP-5	54.3	54.7

Audio review confirmed that ambient noise levels in the Project area are primarily influenced by agricultural activity, birdsong, and local traffic. No turbine noise from existing wind turbine arrays was identified in the audio review of measurement periods exceeding 50 dBA.

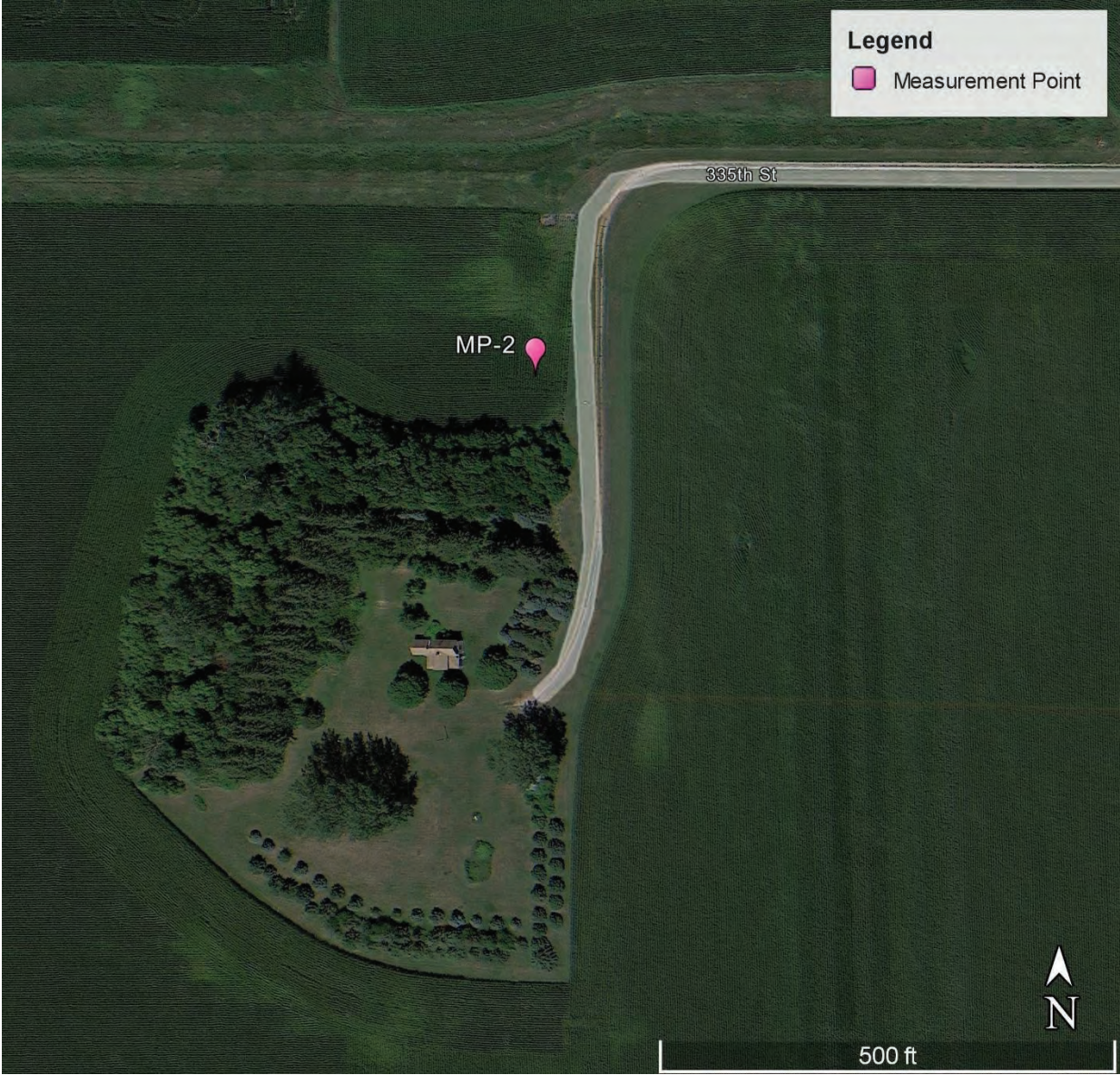
Tabulated hourly measurement data and weather readings can be found in **Appendix D**. Representative 3rd octave band spectra for all 5 locations can be found in **Appendix E**.

Appendix A
Detailed Measurement Location Figures

MP-1



MP-2

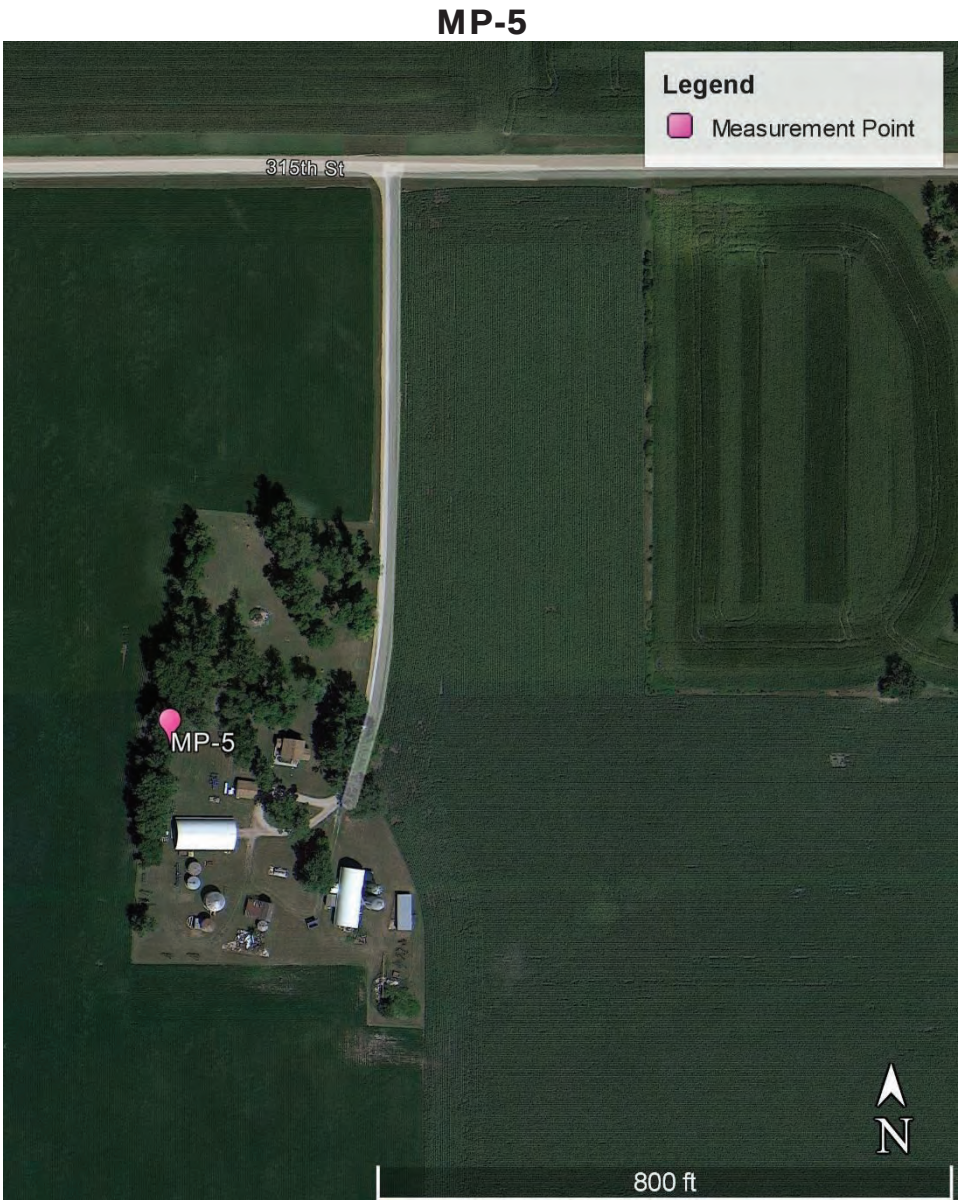


MP-3



MP-4





Appendix B

Field Photographs

MP-1



Facing North



Facing east



Facing south



Facing west

MP-2



Facing north



Facing east



Facing south



Facing west

MP-3



Facing north



Facing east



Facing south



Facing west

MP-4



Facing north



Facing east



Facing south



Facing west

MP-5



Facing north



Facing east



Facing south



Facing west

Appendix C
Field Sheets

Westwood SOUND/NOISE TEAM

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Unattended Field Noise Measurement Sheet

Project Name: Bent Tree North	Project #: R0035761.00
Project Location: Freeborn County, MN	Measurement Location: MP-1
Date: 4/2	Field Engineer: ACS & RDG

Sound Level Meter	Field Calibration	Meteorological Data
Model: NTi XL3	Model: CAL200	Model:
SN: 771 Mic match? ☒	SN: 18893	SN:
Weighting: <u>A</u> /C/Z	Calibration (dB): 94/(114)	Precipitation: <u>Yes</u> /No Temp (°F):
Response: <u>Slow</u> /Fast	Pre-Test: -1.2 dB	Wind: Steady / Gusty / Calm ___ m/s / mph
Windscreen: <u>Yes</u> /No	Post-Test: +0.8 dB	RH (%): Cloud Cover (%):
Topo: Flat / <u>Hilly</u>		Barometric Pressure (inHg):
Terrain: Hard / Soft / <u>Mixed</u> / <u>Agg</u> / Snow		Deployed to Record Meteorological Data? ☐
GPS Coordinates at SLM Location: 43.8145022, -93.5298940		

Location ID	Start Time	Stop Time	Notes/Events
MP-1	8:40am		
4/10/24	16:21		4/3 10:35 am decked & running, new heatpack
4/11/24	13:04		battery swap, running
4/15			bat swap, running ✓
			retrieved

Photos? ☒	Notable additional noise sources:
Site Sketch:	Additional notes: Connect Key: DFQDK-CVWC3 ↓ Hotspot: #3 PW: culvers 1 non-op rail line along rte 13

Westwood SOUND/NOISE TEAM

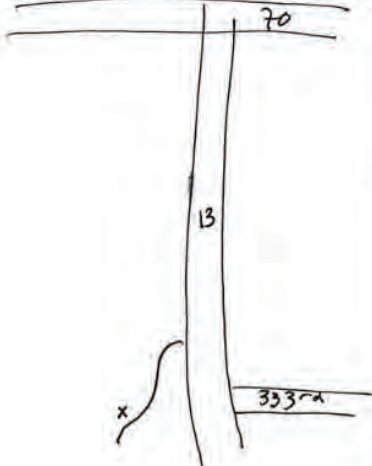
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Unattended Field Noise Measurement Sheet

Project Name: Bent Tree North	Project #: R0035761.00
Project Location: Freeborn County, MN	Measurement Location: MP-2
Date: 4/2	Field Engineer: ACS & RDG

Sound Level Meter	Field Calibration	Meteorological Data
Model: NTi XL3	Model: CAL200	Model:
SN: 89) Mic match? ☒	SN: 18893	SN:
Weighting: <u>D</u> /C/Z	Calibration (dB): 94/(114)	Precipitation: Yes / No
Response: <u>Slow</u> / Fast	Pre-Test: -0.1 dB	Temp (°F):
Windscreen: <u>Yes</u> / No	Post-Test: -0.2 dB	Wind: Steady / Gusty / Calm m/s / mph
Topo: <u>Flat</u> / Hilly		RH (%):
Terrain: Hard / Soft / Mixed / <u>Agg</u> / Snow		Cloud Cover (%):
		Barometric Pressure (inHg):
		Deployed to Record Meteorological Data? ☐
GPS Coordinates at SLM Location: 43.839376, -93.488406		

Location ID	Start Time	Stop Time	Notes/Events
MP-2	9:10		
4/10/24	16:07		4/3 10:49 am checked & running, heat pack added
4/11/24	12:50		Battery swap, checked + running
4/15			Battery swap, checked + running
			retrieved

Photos? ☒	Notable additional noise sources:
Site Sketch: 	Additional notes: Connect Key: Hotspot: None None MP-2 spot directly along crossing is muddy

Westwood SOUND/NOISE TEAM

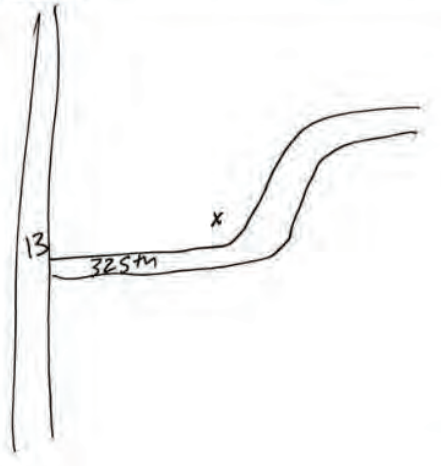
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Unattended Field Noise Measurement Sheet

Project Name: Bent Tree North	Project #: R0035761.00
Project Location: Freeborn County, MN	Measurement Location: <u>MP-3</u>
Date: 4/2	Field Engineer: ACS & RDG

Sound Level Meter	Field Calibration	Meteorological Data
Model: NTi XL3	Model: CAL200	Model:
SN: <u>905</u> Mic match? ☒	SN: 18893	SN:
Weighting: <u>A</u> / C / Z	Calibration (dB): 94 (<u>114</u>)	Precipitation: Yes / No Temp (°F):
Response: <u>Slow</u> / Fast	Pre-Test: -0.1 dB	Wind: Steady / Gusty / Calm ___ m/s / mph
Windscreen: <u>Yes</u> / No	Post-Test: -0.1 dB	RH (%): Cloud Cover (%):
Topo: <u>Flat</u> / Hilly		Barometric Pressure (inHg):
Terrain: Hard / Soft / Mixed / <u>Agg</u> / Snow		Deployed to Record Meteorological Data? ☐
GPS Coordinates at SLM Location: <u>43.819533, -93.466143</u>		

Location ID	Start Time	Stop Time	Notes/Events
<u>MP-3</u>	<u>9:35am</u>		
<u>4/10/24</u>	<u>9:35am</u>	<u>15:50</u>	<u>4/3 10:57am checked & running, new heat pack cable snipped</u>
<u>4/11/24</u>		<u>12:41</u>	<u>homeowner chopped down tree 4/9/24 new cable+battery cal+0.1 and started chickens out in yard</u>
<u>4/15</u>			<u>retrieved</u>

Photos? ☒	Notable additional noise sources:
Site Sketch: 	Additional notes: <u>connect key: T3C59-XPTV3</u> <u>Hotspot: #4</u> <u>PW: 1234</u>

Westwood SOUND/NOISE TEAM

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Unattended Field Noise Measurement Sheet

Project Name: Bent Tree North	Project #: R0035761.00
Project Location: Freeborn County, MN	Measurement Location: MP-4
Date: 4/2	Field Engineer: ACS & RDG + EMB

Sound Level Meter	Field Calibration	Meteorological Data
Model: NTi XL3	Model: CAL200	Model:
SN: 768 ☒ Mic match?	SN: 18893	SN:
Weighting: (A) / C / Z	Calibration (dB): 94 (114)	Precipitation: Yes / No
Response: (Slow) / Fast	Pre-Test: -0.3 dB	Temp (°F):
Windscreen: (Yes) / No	Post-Test: +0.1 dB	Wind: Steady / Gusty / Calm m/s / mph
Topo: (Flat) / Hilly		RH (%):
Terrain: Hard / Soft / Mixed / (Agg) / Snow		Cloud Cover (%):
		Barometric Pressure (inHg):
		Deployed to Record Meteorological Data? ☐
GPS Coordinates at SLM Location: 43.840378, -93.367727		

Location ID	Start Time	Stop Time	Notes/Events
MP-4	10:00 am		
4/4 Thurs	14:53		4/3 11:10 am checked & running, saw heat pack
			Meter checked, cable gnawed through & replaced
			calibration new cable, +0.3 @ 14:53, hot spot
4/10	3:17		+ battery dead system running otherwise
			meter checked, cable frayed but running
4/11	12:12		battery swap
4/15			meter swap, recal -0.1, apply conduit, restart

Photos? ☒	Notable additional noise sources: Train horn audible, bird feeder, furnace etc.
Site Sketch:	Additional notes:
	connect key: 2D MCD - JH42W Hotspot: #2 PW: 13699 ★ Accuright weather station

Westwood SOUND/NOISE TEAM

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Unattended Field Noise Measurement Sheet

Project Name: Bent Tree North	Project #: R0035761.00
Project Location: Freeborn County, MN	Measurement Location: MP-5
Date: 4/2	Field Engineer: ACS & RDG

Sound Level Meter	Field Calibration	Meteorological Data
Model: NTi XL3	Model: CAL200	Model:
SN: 763 ☒ Mic match?	SN: 18893	SN:
Weighting: <u>A</u> /C/Z	Calibration (dB): 94/(114)	Precipitation: Yes / No Temp (°F):
Response: <u>Slow</u> / Fast	Pre-Test: -0.1 dB	Wind: Steady / Gusty / Calm m/s / mph
Windscreen: <u>Yes</u> / No	Post-Test: 0.0 dB	RH (%): Cloud Cover (%):
Topo: <u>Flat</u> / Hilly		Barometric Pressure (inHg):
Terrain: Hard / Soft / Mixed / <u>Agg</u> / Snow		Deployed to Record Meteorological Data? ☐
GPS Coordinates at SLM Location: 43.808862, -93.440662		

Location ID	Start Time	Stop Time	Notes/Events
MP-5	10:20am		11:20am
			4/3 checked & running, new heat pack
4/10/24		15:38	checked, battery swap
4/11/24		12:26	checked, battery swap
4/15/24			retrieved

Photos? ☒	Notable additional noise sources: non-audible WTCs to south
Site Sketch:	Additional notes: connect key: Z2FZW-7MYZW Hotspot: #1 pw: cvlvers2 * Snow accumulation south of I-90

Appendix D Tabulated Measurement & Weather Data

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/2/24 11:00	47.2	47.3	46.8	44.9	45.9	1.6	4.5	0.01
4/2/24 12:00	51.1	46.3	47.6	43.8	45.2	1.4	4.5	0.00
4/2/24 13:00	50.6	40.5	41.2	45.2	50.6	2.2	13.6	0.02
4/2/24 14:00	53.2	48.1	43.3	39.7	54.2	6.0	18.3	0.00
4/2/24 15:00	57.2	45.0	52.4	46.2	58.3	11.9	21.7	0.00
4/2/24 16:00	55.8	55.6	50.1	57.5	58.8	13.7	23.9	0.00
4/2/24 17:00	61.9	49.6	47.9	50.1	61.9	11.4	20.6	0.00
4/2/24 18:00	60.0	49.3	48.5	56.1	57.8	11.9	22.8	0.00
4/2/24 19:00	51.5	48.9	47.4	45.1	47.7	5.3	21.7	0.00
4/2/24 20:00	50.2	46.3	43.1	44.1	50.9	6.6	17.2	0.00
4/2/24 21:00	56.4	46.5	43.8	38.3	52.8	7.6	15.9	0.00
4/2/24 22:00	54.4	46.9	44.6	41.4	47.5	5.7	17.2	0.00
4/2/24 23:00	44.9	50.1	48.8	39.8	46.8	2.4	9.2	0.00
4/3/24 0:00	54.9	49.4	40.4	43.5	58.1	8.8	20.6	0.00
4/3/24 1:00	56.9	55.4	45.2	47.6	59.7	16.2	25.1	0.00
4/3/24 2:00	56.8	55.1	50.4	45.1	58.7	17.4	28.6	0.00
4/3/24 3:00	57.7	50.7	52.6	48.6	61.2	17.2	25.1	0.00
4/3/24 4:00	60.4	57.6	52.8	54.3	65.1	19.8	29.8	0.00
4/3/24 5:00	59.8	52.4	50.1	53.8	64.1	22.9	33.1	0.00
4/3/24 6:00	59.6	51.4	60.6	53.4	64.6	22.7	30.9	0.00
4/3/24 7:00	59.3	59.1	55.6	58.0	65.3	21.8	29.8	0.00
4/3/24 8:00	61.3	54.2	56.1	55.8	61.6	24.4	33.1	0.00
4/3/24 9:00	60.9	54.3	52.4	53.4	65.4	21.8	32.0	0.00
4/3/24 10:00	65.0	59.6	57.3	56.4	68.1	22.4	29.8	0.00
4/3/24 11:00	70.0	56.7	58.5	52.1	69.7	24.3	33.1	0.00
4/3/24 12:00	69.0	64.4	65.2	53.3	65.5	22.2	32.0	0.00
4/3/24 13:00	67.2	65.8	60.8	55.7	68.2	24.4	34.2	0.00
4/3/24 14:00	66.0	49.3	59.3	57.2	66.9	22.3	35.3	0.00
4/3/24 15:00	68.5	66.6	57.0	51.1	68.2	16.0	35.3	0.00
4/3/24 16:00	71.1	60.0	59.2	53.7	70.3	16.3	36.5	0.00
4/3/24 17:00	65.0	66.4	54.5	51.4	69.0	21.3	34.2	0.00
4/3/24 18:00	66.0	48.2	55.1	53.2	59.5	8.9	25.1	0.00
4/3/24 19:00	60.5	51.3	46.7	46.2	58.1	6.4	21.7	0.00
4/3/24 20:00	60.7	51.2	45.5	40.7	53.1	7.8	17.2	0.00
4/3/24 21:00	46.8	34.2	33.0		35.3	1.8	10.3	0.00
4/3/24 22:00	23.9	38.0	30.9		24.3	3.4	9.2	0.00
4/3/24 23:00	29.1	23.2	25.6		29.6	1.4	3.4	0.00
4/4/24 0:00	22.1	29.2	27.9		24.4	0.5	2.2	0.00
4/4/24 1:00	19.2	25.2	23.3		24.7	1.3	5.8	0.00
4/4/24 2:00	24.1	28.7	26.7		27.5	4.3	5.8	0.00
4/4/24 3:00	27.6	26.4	27.2		26.2	3.1	5.8	0.00
4/4/24 4:00	28.5	27.9	20.5		26.2	2.1	6.9	0.00
4/4/24 5:00	24.8	39.7	31.6		30.2	3.8	8.1	0.00
4/4/24 6:00	32.7	34.8	40.6		33.4	6.9	9.2	0.00
4/4/24 7:00	36.4	37.1	52.0		36.3	7.2	10.3	0.00
4/4/24 8:00	43.4	48.3	43.6		48.3	9.7	17.2	0.00
4/4/24 9:00	52.4	45.6	47.9		52.0	11.6	17.2	0.00
4/4/24 10:00	53.4	44.5	44.5		52.6	8.0	19.5	0.00
4/4/24 11:00	54.1	50.1	53.7		52.4	6.3	20.6	0.00
4/4/24 12:00	56.0	51.3	42.2		55.4	6.0	20.6	0.00
4/4/24 13:00	53.3	47.4	41.6		45.8	5.0	18.3	0.00
4/4/24 14:00	47.7	41.0	39.5		45.7	3.7	12.5	0.00
4/4/24 15:00	50.0	42.9	39.3	30.8	44.9	3.5	14.8	0.00
4/4/24 16:00	43.4	38.2	45.3	28.0	40.0	4.9	17.2	0.00
4/4/24 17:00	42.5	43.7	36.5	20.3	38.1	3.4	8.1	0.00

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/4/24 18:00	48.3	38.8	41.9	28.7	41.1	3.2	9.2	0.00
4/4/24 19:00	45.1	37.6	35.2	18.6	36.3	1.9	4.5	0.00
4/4/24 20:00	36.0	36.5	31.6	20.8	24.7	2.2	4.5	0.00
4/4/24 21:00	51.9	37.4	23.5	19.6	24.9	4.1	6.9	0.00
4/4/24 22:00	19.5	45.5	25.9	21.3	24.9	2.5	4.5	0.00
4/4/24 23:00	25.2	41.6	40.1	29.6	23.3	0.9	2.2	0.00
4/5/24 0:00	27.0	30.6	21.2	25.8	20.5	0.8	3.4	0.00
4/5/24 1:00	22.3	17.0	17.9	36.8	19.0	1.5	2.2	0.00
4/5/24 2:00	17.3	16.1	17.0	46.2	17.7	1.0	2.2	0.00
4/5/24 3:00	28.2	20.2	25.2	54.0	17.8	1.2	2.2	0.00
4/5/24 4:00	17.4	18.3	18.2	42.1	25.0	0.9	2.2	0.00
4/5/24 5:00	18.6	25.3	24.4	40.8	29.0	1.1	2.2	0.00
4/5/24 6:00	36.0	31.8	33.3	37.6	29.7	1.4	2.2	0.00
4/5/24 7:00	48.4	37.8	39.8	39.4	39.0	2.4	8.1	0.00
4/5/24 8:00	41.5	41.2	42.8	35.6	47.7	2.9	6.9	0.00
4/5/24 9:00	49.5	49.4	31.8	45.2	34.5	6.4	12.5	0.00
4/5/24 10:00	42.2	34.6	33.9		43.0	5.1	12.5	0.00
4/5/24 11:00	46.3	32.1	43.4		28.7	8.5	15.9	0.00
4/5/24 12:00	40.4	41.9	42.5		32.4	8.1	17.2	0.00
4/5/24 13:00	39.1	41.4	48.2		28.7	8.5	17.2	0.00
4/5/24 14:00	37.9	32.0	48.4		31.2	6.8	14.8	0.00
4/5/24 15:00	43.8	43.3	36.8	35.0	29.7	8.4	14.8	0.00
4/5/24 16:00	37.4	36.7	33.1	37.9	28.9	6.7	13.6	0.00
4/5/24 17:00	30.7	36.5	32.4	53.0	33.6	6.7	11.4	0.00
4/5/24 18:00	34.4	48.5	32.4	35.9	30.0	6.3	11.4	0.00
4/5/24 19:00	41.6	34.5	27.6	38.3	30.8	5.4	10.3	0.00
4/5/24 20:00	41.9	40.0	39.7	41.4	29.1	2.5	5.8	0.00
4/5/24 21:00	43.8	30.4	28.0	23.7	26.2	0.9	4.5	0.00
4/5/24 22:00	42.2	35.7	31.8	27.0	37.2	0.7	3.4	0.00
4/5/24 23:00	45.0	34.6	48.2	24.2	32.9	1.0	5.8	0.00
4/6/24 0:00	50.4	28.2	25.8	22.5	22.3	1.1	4.5	0.00
4/6/24 1:00	28.2	41.1	22.5	35.4	22.2	2.9	5.8	0.00
4/6/24 2:00	34.0	33.3	26.6	30.9	31.1	0.7	2.2	0.00
4/6/24 3:00	29.6	27.9	32.7	24.9	32.8	1.5	3.4	0.00
4/6/24 4:00	32.2	30.1	25.3	31.1	28.9	1.1	3.4	0.00
4/6/24 5:00	32.0	30.7	30.4	23.2	32.2	0.9	2.2	0.00
4/6/24 6:00	32.7	32.8	32.7	43.3	37.7	0.7	3.4	0.00
4/6/24 7:00	40.8	42.1	38.7	46.2	41.9	2.3	5.8	0.00
4/6/24 8:00	41.7	44.2	42.1	43.5	45.2	2.1	4.5	0.00
4/6/24 9:00	53.7	52.8	60.1	59.1	51.3	2.9	6.9	0.00
4/6/24 10:00	64.5	58.1	55.1	59.0	63.8	3.1	5.8	0.00
4/6/24 11:00	64.6	61.5	56.2	58.6	64.7	3.5	11.4	0.00
4/6/24 12:00	65.9	61.6	57.4	58.4	63.5	6.0	13.6	0.00
4/6/24 13:00	63.0	65.2	60.5	61.1	63.2	6.1	13.6	0.00
4/6/24 14:00	65.4	62.0	57.8	58.5	63.6	5.9	11.4	0.00
4/6/24 15:00	64.9	60.3	57.5	60.1	64.5	4.8	14.8	0.00
4/6/24 16:00	64.1	62.4	59.0	63.7	63.9	4.7	15.9	0.00
4/6/24 17:00	65.3	61.1	55.8	61.0	60.9	5.5	14.8	0.00
4/6/24 18:00	65.0	63.2	54.9	61.1	59.7	4.1	11.4	0.00
4/6/24 19:00	62.6	63.6	51.5	60.6	58.5	4.4	12.5	0.00
4/6/24 20:00	57.4	58.4	57.2	58.1	61.6	2.1	6.9	0.00
4/6/24 21:00	57.8	62.6	53.1	60.6	61.9	0.0	0.0	0.00
4/6/24 22:00	66.3	64.7	63.1	61.6	65.2	0.0	0.0	0.00
4/6/24 23:00	63.5	60.5	58.4	59.3	63.6	0.0	0.0	0.00
4/7/24 0:00	62.5	62.0	57.3	61.4	63.3	0.0	0.0	0.00
4/7/24 1:00	64.6	65.1	56.3	57.4	61.5	0.0	0.0	0.00
4/7/24 2:00	65.1	57.8	55.8	56.1	59.7	0.0	0.0	0.00
4/7/24 3:00	61.9	59.4	51.1	55.4	58.3	0.0	0.0	0.00

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/7/24 4:00	62.1	59.3	53.2	60.0	59.0	0.0	0.0	0.00
4/7/24 5:00	57.6	65.8	59.2	57.7	63.8	0.0	0.0	0.00
4/7/24 6:00	64.5	57.8	56.2	57.4	62.7	0.0	0.0	0.00
4/7/24 7:00	62.7	61.3	57.3	57.1	60.7	0.0	0.0	0.00
4/7/24 8:00	63.2	62.8	57.2	59.2	55.1	0.6	4.5	0.00
4/7/24 9:00	60.9	64.4	57.8	56.6	59.3	2.8	5.8	0.00
4/7/24 10:00	63.1	60.3	55.1	58.7	59.1	4.1	8.1	0.00
4/7/24 11:00	63.0	62.6	57.1	56.6	60.3	6.0	11.4	0.00
4/7/24 12:00	62.9	61.6	55.1	55.8	59.1	8.6	20.6	0.00
4/7/24 13:00	60.8	58.6	45.4	54.0	57.0	9.4	18.3	0.00
4/7/24 14:00	62.8	58.0	53.3	53.1	59.9	9.4	20.6	0.00
4/7/24 15:00	56.2	55.6	53.5	51.1	55.4	10.7	17.2	0.00
4/7/24 16:00	52.3	51.7	47.9	51.7	48.3	13.4	25.1	0.00
4/7/24 17:00	47.6	53.2	48.3	51.6	48.5	14.5	25.1	0.00
4/7/24 18:00	52.7	54.9	54.9	47.0	48.1	9.5	20.6	0.00
4/7/24 19:00	49.8	52.6	50.3	52.0	48.9	10.0	19.5	0.00
4/7/24 20:00	54.8	56.3	51.3	54.5	51.3	9.5	14.8	0.00
4/7/24 21:00	49.4	52.8	53.2	46.9	48.7	6.6	11.4	0.00
4/7/24 22:00	48.6	52.4	44.5	46.2	48.6	8.4	14.8	0.00
4/7/24 23:00	47.9	44.7	36.3	44.4	38.4	9.4	14.8	0.00
4/8/24 0:00	46.6	40.2	40.3	37.2	37.1	6.8	13.6	0.00
4/8/24 1:00	42.1	42.4	36.2	38.1	37.6	3.9	8.1	0.00
4/8/24 2:00	42.4	40.6	35.1	37.9	39.3	4.5	10.3	0.00
4/8/24 3:00	47.3	34.9	30.0	35.5	40.7	2.0	4.5	0.00
4/8/24 4:00	39.4	48.4	31.7	32.8	35.3	1.1	4.5	0.00
4/8/24 5:00	44.9	37.4	47.0	37.0	36.6	0.4	2.2	0.00
4/8/24 6:00	39.4	34.5	40.8	28.4	36.6	0.6	2.2	0.00
4/8/24 7:00	45.6	38.0	46.1	46.3	47.2	0.2	1.1	0.00
4/8/24 8:00	43.8	37.6	48.8	46.3	52.2	0.4	2.2	0.00
4/8/24 9:00	53.9	48.7	46.9	50.4	54.1	1.3	3.4	0.00
4/8/24 10:00	41.7	36.2	53.1	50.5	55.0	2.1	3.4	0.00
4/8/24 11:00	49.3	43.1	55.5	56.1	57.9	3.5	11.4	0.00
4/8/24 12:00	41.0	45.8	57.8	54.2	57.8	4.1	13.6	0.00
4/8/24 13:00	49.0	43.0	58.0	50.9	55.3	6.3	27.3	0.00
4/8/24 14:00	42.9	35.7	46.3	50.3	53.6	9.0	23.9	0.00
4/8/24 15:00	50.6	44.7	48.4	47.9	47.6	12.6	28.6	0.00
4/8/24 16:00	54.7	39.8	49.1	49.3	49.8	10.8	21.7	0.00
4/8/24 17:00	44.4	38.3	47.6	40.6	40.3	13.4	22.8	0.00
4/8/24 18:00	55.2	29.6	41.6	38.3	35.7	10.4	17.2	0.00
4/8/24 19:00	58.8	36.3	38.9	47.2	41.6	8.2	15.9	0.00
4/8/24 20:00	33.7	36.5	46.8	41.4	33.6	7.1	14.8	0.00
4/8/24 21:00	35.1	39.6	38.5	29.4	34.5	3.1	6.9	0.00
4/8/24 22:00	36.0	25.8	44.9	29.7	41.2	2.6	5.8	0.00
4/8/24 23:00	25.6	23.3	35.7	32.5	36.1	2.2	5.8	0.00
4/9/24 0:00	26.1	28.4	36.9	38.5	42.2	1.7	3.4	0.00
4/9/24 1:00	26.4	26.1	36.4	37.7	44.0	1.4	5.8	0.00
4/9/24 2:00	27.5	28.0	38.6	38.8	40.1	2.2	5.8	0.00
4/9/24 3:00	21.0	29.2	42.6	34.6	46.2	1.7	4.5	0.00
4/9/24 4:00	34.4	37.2	38.4	30.6	39.9	2.1	6.9	0.00
4/9/24 5:00	22.7	31.8	33.8	21.3	31.6	0.9	3.4	0.00
4/9/24 6:00	45.7	28.7	37.3	35.7	31.0	1.4	3.4	0.00
4/9/24 7:00	41.9	41.4	48.2	37.8	37.7	0.6	3.4	0.00
4/9/24 8:00	40.8	38.9	41.9	44.7	41.8	2.5	5.8	0.00
4/9/24 9:00	44.7	36.5	45.7	43.1	45.7	3.0	9.2	0.00
4/9/24 10:00	43.0	33.0	41.7	50.2	44.4	2.0	6.9	0.00
4/9/24 11:00	56.6	31.0	44.0	51.7	43.9	2.3	5.8	0.00
4/9/24 12:00	48.6	31.6	51.3	42.4	46.4	1.9	4.5	0.00
4/9/24 13:00	40.4	37.3	47.9	45.4	47.7	2.6	6.9	0.00

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/9/24 14:00	39.4	36.2	71.2	50.3	53.5	2.2	5.8	0.00
4/9/24 15:00	43.0	49.0	59.0	47.3	54.9	2.1	6.9	0.00
4/9/24 16:00	43.1	37.6	50.7	51.3	57.2	1.5	4.5	0.00
4/9/24 17:00	41.9	38.7	46.7	52.0	51.6	1.7	5.8	0.00
4/9/24 18:00	32.6	39.3	45.9	47.5	48.5	1.1	3.4	0.00
4/9/24 19:00	53.6	30.7	40.6	49.4	37.8	2.0	4.5	0.00
4/9/24 20:00	58.2	29.8	37.7	42.3	30.1	1.4	3.4	0.00
4/9/24 21:00	48.4	29.2	36.4	23.2	29.5	0.7	2.2	0.00
4/9/24 22:00	19.4	30.5	33.7	19.0	28.9	0.3	1.1	0.00
4/9/24 23:00	29.9	30.3	40.4	30.1	32.8	0.6	2.2	0.00
4/10/24 0:00	26.4	25.6	25.9	20.3	27.1	0.8	2.2	0.00
4/10/24 1:00	19.3	32.1	23.9	18.8	27.4	0.7	2.2	0.00
4/10/24 2:00	17.3	23.2	23.0	19.7	25.5	1.1	2.2	0.00
4/10/24 3:00	20.4	25.2	22.4	18.2	23.6	1.9	6.9	0.00
4/10/24 4:00	20.4	25.2	20.9	19.7	25.5	3.5	6.9	0.00
4/10/24 5:00	19.6	26.7	24.7	25.5	24.8	3.9	9.2	0.00
4/10/24 6:00	29.6	39.3	48.2	55.5	32.9	3.0	5.8	0.00
4/10/24 7:00	40.8	49.6	41.9	38.2	37.9	1.9	4.5	0.00
4/10/24 8:00	41.9	37.9	46.4	49.7	41.6	4.6	10.3	0.00
4/10/24 9:00	43.8	33.1	41.1	42.1	39.3	5.8	10.3	0.00
4/10/24 10:00	56.7	29.1	38.5	44.7	37.8	6.3	11.4	0.00
4/10/24 11:00	36.4	26.3	50.1	37.7	36.3	7.3	12.5	0.00
4/10/24 12:00	59.1	36.6	48.3	42.6	45.6	8.0	15.9	0.00
4/10/24 13:00	40.2	30.7	49.3	38.2	46.6	9.2	13.6	0.00
4/10/24 14:00	32.1	44.5	40.7	45.9	44.5	6.8	12.5	0.00
4/10/24 15:00	41.5	44.7	41.5	35.3	42.9	8.9	17.2	0.00
4/10/24 16:00	30.8	26.7		37.3	43.1	8.0	15.9	0.00
4/10/24 17:00	45.2	40.8		36.4	35.0	7.3	12.5	0.00
4/10/24 18:00	57.9	52.6		42.3	40.6	6.6	11.4	0.00
4/10/24 19:00	31.8	30.5		35.8	41.5	6.5	12.5	0.00
4/10/24 20:00	46.7	30.6		32.0	32.3	5.2	11.4	0.00
4/10/24 21:00	46.0	27.5		31.8	31.1	2.6	8.1	0.00
4/10/24 22:00	33.6	33.7		35.2	35.1	2.9	5.8	0.00
4/10/24 23:00	19.9	27.3		19.4	24.1	3.1	5.8	0.00
4/11/24 0:00	25.3	32.7		25.6	36.3	4.6	8.1	0.00
4/11/24 1:00	20.2	28.9		23.8	28.7	7.1	12.5	0.00
4/11/24 2:00	31.6	31.4		24.1	33.8	6.0	13.6	0.00
4/11/24 3:00	30.6	31.7		23.6	31.7	6.1	13.6	0.00
4/11/24 4:00	34.9	37.0		28.7	34.4	7.1	13.6	0.00
4/11/24 5:00	44.0	41.3		36.5	48.5	8.4	13.6	0.00
4/11/24 6:00	52.0	47.9		46.8	53.3	6.8	12.5	0.00
4/11/24 7:00	42.6	41.5		48.1	52.7	7.2	14.8	0.00
4/11/24 8:00	41.0	39.1		53.3	44.7	7.7	15.9	0.00
4/11/24 9:00	42.2	37.7		38.6	43.8	8.8	19.5	0.00
4/11/24 10:00	42.0	41.4		44.2	48.8	7.4	12.5	0.00
4/11/24 11:00	44.8	36.5		43.1	52.5	8.9	17.2	0.00
4/11/24 12:00	46.8	41.0		46.7	53.2	8.8	17.2	0.00
4/11/24 13:00	60.5	44.0	44.4	44.9	52.5	6.7	17.2	0.00
4/11/24 14:00	52.1	47.5	51.9	47.7	55.1	8.2	18.3	0.00
4/11/24 15:00	62.2	51.6	58.1	45.4	57.7	6.8	13.6	0.00
4/11/24 16:00	62.1	45.5	52.0	58.5	63.4	5.8	10.3	0.00
4/11/24 17:00	72.4	47.3	52.7	39.9	46.8	6.2	15.9	0.00
4/11/24 18:00	58.5	47.4	46.9	51.4	57.0	6.3	18.3	0.00
4/11/24 19:00	52.2	45.1	55.8	51.5	54.0	5.6	10.3	0.00
4/11/24 20:00	51.5	49.8	55.4	49.2	59.6	8.6	15.9	0.00
4/11/24 21:00	43.1	39.2	46.7	37.2	43.8	9.8	14.8	0.00
4/11/24 22:00	42.0	33.5	37.0	33.8	37.7	7.5	12.5	0.00
4/11/24 23:00	47.6	39.3	38.0	34.4	46.1	13.3	21.7	0.00

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/12/24 0:00	46.1	37.4	39.5	37.5	42.4	13.5	23.9	0.00
4/12/24 1:00	44.3	37.1	37.1	44.7	47.1	11.7	23.9	0.00
4/12/24 2:00	40.4	35.3	36.1	35.8	47.2	11.0	19.5	0.04
4/12/24 3:00	42.6	36.6	41.5	36.2	45.7	8.5	18.3	0.00
4/12/24 4:00	41.4	36.3	43.1	37.3	44.9	8.2	19.5	0.00
4/12/24 5:00	37.3	38.4	39.5	38.4	43.1	6.3	17.2	0.00
4/12/24 6:00	37.3	40.9	47.7	46.4	43.9	4.1	8.1	0.00
4/12/24 7:00	42.0	44.4	46.1	37.2	46.8	4.0	10.3	0.00
4/12/24 8:00	40.9	44.3	43.4	41.8	46.0	4.9	10.3	0.00
4/12/24 9:00	45.5	43.7	48.4	46.8	51.3	3.6	8.1	0.00
4/12/24 10:00	52.0	47.3	47.3	46.4	53.3	4.4	10.3	0.00
4/12/24 11:00	58.9	54.8	47.4	49.1	62.5	4.0	6.9	0.00
4/12/24 12:00	59.6	63.1	53.4	49.5	62.8	5.0	11.4	0.00
4/12/24 13:00	63.7	53.4	60.7	50.8	63.4	5.0	12.5	0.00
4/12/24 14:00	60.0	56.3	48.6	55.9	65.6	3.8	9.2	0.00
4/12/24 15:00	54.8	55.5	58.0	52.0	60.3	2.3	6.9	0.00
4/12/24 16:00	52.7	46.2	51.9	56.2	60.9	1.6	4.5	0.00
4/12/24 17:00	50.4	46.7	44.7	48.3	54.3	1.5	6.9	0.00
4/12/24 18:00	48.6	44.7	45.3	40.7	55.3	1.8	4.5	0.00
4/12/24 19:00	46.7	33.4	40.4	40.3	52.3	2.5	5.8	0.00
4/12/24 20:00	47.1	35.2	29.3	40.0	25.4	3.4	6.9	0.13
4/12/24 21:00	47.8	29.4	40.0	21.7	25.5	3.2	8.1	0.00
4/12/24 22:00	18.3	17.3	28.5	19.3	23.9	0.7	3.4	0.00
4/12/24 23:00	26.1	30.7	26.9	25.8	27.5	0.3	3.4	0.00
4/13/24 0:00	18.3	16.3	17.2	23.4	19.8	1.1	4.5	0.00
4/13/24 1:00	20.3	34.2	21.1	17.1	17.2	1.0	4.5	0.00
4/13/24 2:00	17.3	31.2	27.0	16.9	17.8	1.5	3.4	0.00
4/13/24 3:00	17.5	17.9	16.6	18.3	17.9	1.3	4.5	0.00
4/13/24 4:00	20.1	23.6	29.1	16.9	17.7	1.2	4.5	0.00
4/13/24 5:00	22.6	24.5	41.9	29.3	24.1	1.4	4.5	0.00
4/13/24 6:00	31.7	34.3	36.3	38.1	32.4	1.3	4.5	0.00
4/13/24 7:00	42.6	33.2	43.0	38.1	41.8	3.3	8.1	0.03
4/13/24 8:00	48.4	42.2	44.2	37.3	41.9	5.0	9.2	0.10
4/13/24 9:00	54.9	50.9	48.3	42.5	51.7	4.5	8.1	0.06
4/13/24 10:00	55.4	47.2	50.1	53.3	52.7	4.3	9.2	0.02
4/13/24 11:00	60.2	54.0	50.2	57.3	55.2	3.1	8.1	0.02
4/13/24 12:00	61.9	54.9	56.5	58.3	57.3	2.1	4.5	0.06
4/13/24 13:00	66.5	51.4	59.0	60.0	59.2	1.2	5.8	0.05
4/13/24 14:00	61.1	51.9	56.1	56.2	60.7	1.8	4.5	0.12
4/13/24 15:00	60.8	46.1	56.7	60.1	58.8	1.6	4.5	0.02
4/13/24 16:00	60.6	47.5	53.4	60.6	58.7	1.7	4.5	0.03
4/13/24 17:00	57.0	47.8	54.1	59.3	58.5	1.5	4.5	0.00
4/13/24 18:00	59.3	44.0	56.1	58.2	58.6	1.3	3.4	0.00
4/13/24 19:00	51.6	42.5	48.0	52.9	56.7	1.0	3.4	0.00
4/13/24 20:00	43.5	40.8	45.9	46.9	46.4	0.9	3.4	0.00
4/13/24 21:00	40.2	32.8	37.2	37.7	42.6	0.9	3.4	0.00
4/13/24 22:00	37.5	37.8	44.1	40.2	46.2	1.3	4.5	0.01
4/13/24 23:00	47.0	36.0	41.7	42.7	51.2	1.2	4.5	0.00
4/14/24 0:00	38.0	31.7	38.5	30.9	42.6	0.9	3.4	0.00
4/14/24 1:00	21.1	20.3	32.7	29.2	29.3	0.2	1.1	0.00
4/14/24 2:00	22.4	22.1	27.3	21.5	29.0	1.2	4.5	0.00
4/14/24 3:00	21.1	19.5	25.4	18.8	28.0	4.8	10.3	0.14
4/14/24 4:00	43.4	26.5	24.0	20.2	22.2	2.2	8.1	0.05
4/14/24 5:00	42.1	19.0	22.9	20.1	24.0	1.1	3.4	0.00
4/14/24 6:00	30.8	37.5	38.3	46.8	25.9	1.5	4.5	0.00
4/14/24 7:00	38.7	34.8	33.1	40.8	36.3	1.7	3.4	0.00
4/14/24 8:00	55.5	49.2	42.1	41.9	40.7	2.7	6.9	0.00
4/14/24 9:00	39.5	37.1	41.7	38.1	35.7	3.0	6.9	0.00

Date & Time	LAeq-1 hour					Winds Speeds		Average Rainfall (in/hour)
	MP-1	MP-2	MP-3	MP-4	MP-5	Hourly Avg (mph)	Max Gust (mph)	
4/14/24 10:00	38.6	53.7	46.4	41.9	50.2	2.7	6.9	0.00
4/14/24 11:00	33.9	41.3	34.4	51.5	41.0	3.3	6.9	0.00
4/14/24 12:00	51.0	45.0	48.7	43.6	57.1	3.2	8.1	0.00
4/14/24 13:00	51.7	52.7	43.4	46.8	60.7	3.1	6.9	0.00
4/14/24 14:00	51.0	41.8	50.7	43.9	57.9	2.9	9.2	0.00
4/14/24 15:00	56.5	46.3	44.1	40.6	53.8	2.9	13.6	0.00
4/14/24 16:00	51.4	47.5	46.7	36.6	53.2	3.1	5.8	0.00
4/14/24 17:00	49.0	38.2	42.0	45.1	45.3	2.2	8.1	0.00
4/14/24 18:00	50.5	45.7	47.8	41.7	49.2	0.8	2.2	0.00
4/14/24 19:00	44.1	40.4	38.6	35.9	49.2	0.2	1.1	0.00
4/14/24 20:00	22.5	39.5	36.5	34.6	30.6	0.1	1.1	0.00
4/14/24 21:00	19.0	26.9	22.2	32.5	35.4	0.7	2.2	0.00
4/14/24 22:00	48.3	30.9	23.8	22.6	20.8	0.0	1.1	0.00
4/14/24 23:00	31.7	23.7	23.9	16.8	17.5	0.2	1.1	0.00
4/15/24 0:00	17.1	36.7	22.0	17.6	17.5	0.3	2.2	0.00
4/15/24 1:00	16.6	19.3	24.7	17.0	17.6	0.0	1.1	0.00
4/15/24 2:00	16.9	20.4	21.0	17.2	17.7	0.0	0.0	0.00
4/15/24 3:00	17.4	30.8	27.2	19.4	18.6	0.0	0.0	0.00
4/15/24 4:00	20.3	29.6	18.7	20.2	21.2	0.0	0.0	0.00
4/15/24 5:00	17.8	21.4	27.4	27.7	25.9	0.0	0.0	0.00
4/15/24 6:00	38.6	37.9	36.1	49.4	25.3	0.1	1.1	0.00
4/15/24 7:00	50.1	34.7	47.7	57.4	33.1	0.9	3.4	0.00
4/15/24 8:00	42.9	41.3	42.9	41.8	35.2	2.0	3.4	0.00
4/15/24 9:00	38.4	42.6	38.0	39.7	36.7	3.3	6.9	0.00
4/15/24 10:00	45.0	46.7	51.5	45.1	39.9	4.5	8.1	0.00
4/15/24 11:00	38.8	43.3	39.1	41.1	38.4	4.8	8.1	0.00
4/15/24 12:00	36.7	43.4	49.0	37.9	34.7	6.8	14.8	0.00
4/15/24 13:00	42.4	40.4	36.3	40.5	37.7	7.7	13.6	0.00
4/15/24 14:00	42.8	48.3	42.3	43.6	39.5	5.8	10.3	0.00
4/15/24 15:00	44.0	46.5	39.1	39.7	38.1	2.4	6.9	0.00
4/15/24 16:00	41.6	42.4	47.4	39.9	43.4	0.2	2.2	0.00
4/15/24 17:00	42.2	47.7	41.4	41.6	41.2	1.1	3.4	0.00
4/15/24 18:00	46.0	51.5	45.5	46.5	45.7	2.2	5.8	0.00

*Missing data due to wildlife interference and/or equipment maintenance.

Appendix E

Representative 1/3-Octave Band Measurement Results

1/3 Octave Band Center Frequency	24-Hour Average from April 9 th				
	MP-1	MP-2	MP-3	MP-4	MP-5
6.3	69.1	47.7	77.3	64.8	84.2
8	67.7	46.1	75.4	63	81.4
10	66.1	44.3	72.9	61	79.1
12.5	64.4	42.7	70	58.7	76.6
16	62.8	42.7	67	56.6	73.7
20	61.3	43	63.9	54.4	70.8
25	59.9	42.8	61	51.8	67.4
31.5	58.7	41.7	58	49.5	63.9
40	57.6	39.7	55	47.5	60.5
50	56.4	37.8	52.1	44.9	57.3
63	55.2	39.3	52.6	43	54.5
80	54.2	38.5	52.4	41.7	52.3
100	52.6	34.4	55.9	40	50.6
125	51.1	33.8	53.3	40.4	48.9
160	49.9	33.3	55.3	40.8	49.2
200	48.6	30.5	48.6	39.3	48.4
250	47	28.5	47	38.1	46.2
315	45.7	29	45.7	36.9	45.2
400	44.2	29.3	45.3	35.4	43.4
500	42.7	34.4	44.6	34.3	41.9
630	41.4	29.4	44.7	33.9	40.1
800	40	28.3	46.3	33.4	37.9
1000	41	32.3	45.9	32.9	36.2
1250	37.4	26.2	43.7	31.6	34.2
1600	36.1	25.7	41.4	31.2	31.9
2000	34.5	25.6	40.4	31.3	29.8
2500	33.1	29.2	42	37	28.4
3150	33.1	29.9	39.5	37.9	26.9
4000	35.6	30.6	38.1	35.6	25.8
5000	31.7	26.3	34.3	31	25.2
6300	29	21	31.2	26.7	25.1
8000	27.9	17.5	27.9	21.3	23.7
10000	26.9	11.7	24	11.9	12.2
12500	26.1	7.5	19.6	7.2	6.5
16000	25.4	5.5	13.7	4.7	4.9
20000	24.7	4.3	7.6	4	4.2